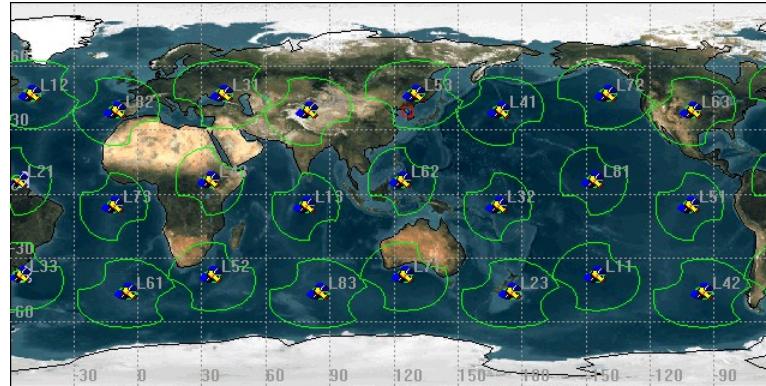




Army Space Modeling & Simulation Roadmap



**Mr. Steve Chambers
Army Space Modeling & Simulation
Focus Area Collaborative Team
(Space M&S FACT)
25 SEP 02**

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***Secure the High
Ground***



Agenda

- **Background & Organization**
- **Process Overview**
- **Results & Recommendations**
- **Summary**



Space M&S

- **Space Mission Areas[†]**

- Force Enhancement
- Force Application
- Space Control
- Space Support

- **Army Space M&S**

- Entities, Attributes, & Behaviors Based in Space
- Information Derived from or Communicated through Space
- Interactions among Orbiting and/or Terrestrial Systems
- Space Environment
- Supporting Algorithm & Data Development

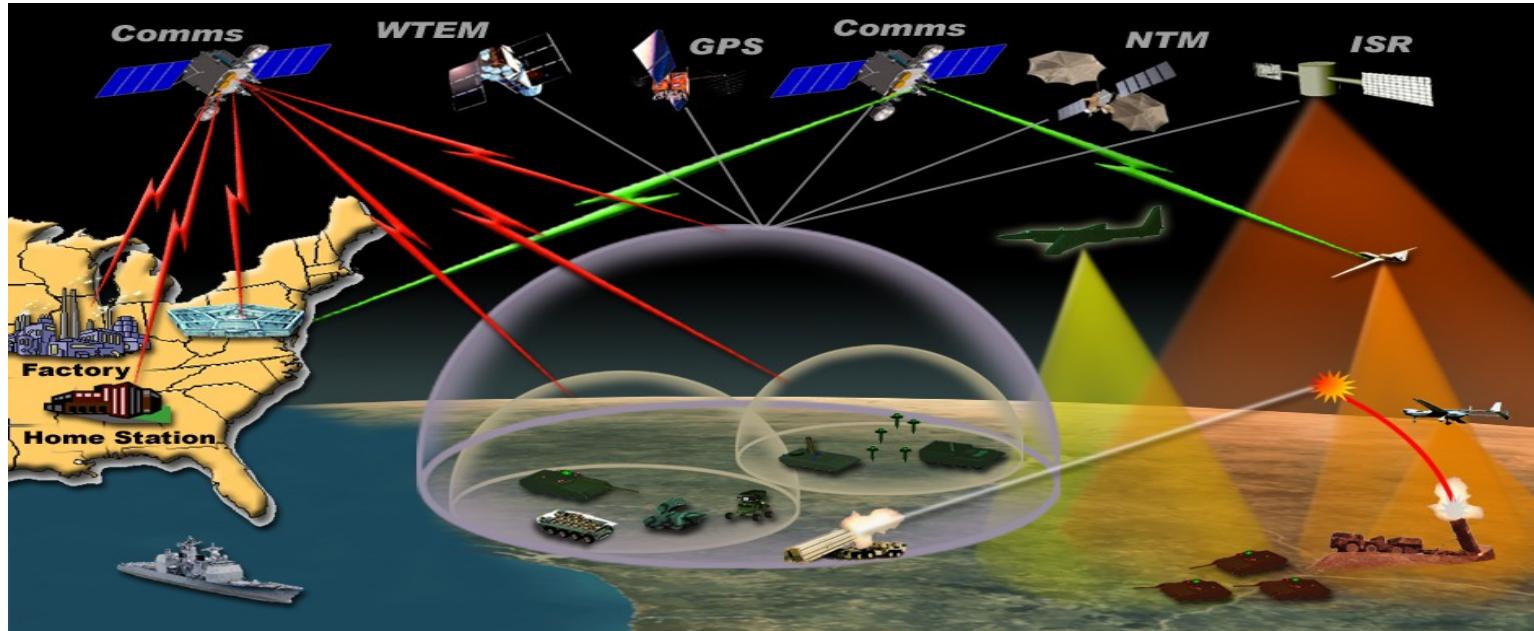
- **Space Related Functions**

- Space-based ISR
- Space Communications
- Early Warning
- Blue Force Tracking
- Space Derived Weather
- Information Operations
- Space Weather
- GPS/Position & Navigation
- Protection of Critical Space Systems
- Prevention of Unauthorized Access
- Negation of Hostile Systems
- Surveillance of Space
- Computer Network Attack
- Computer Network Defense
- Space Lift
- Satellite Operations

[†]Joint Publication 3-14 Space Operations



Space Enables the Objective Force



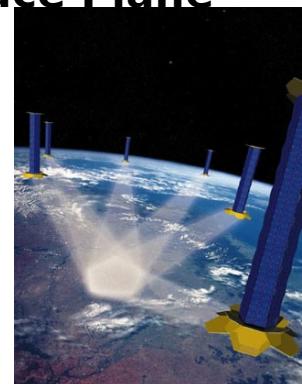
- Access to a Global Information Grid of Knowledge & Services
- Common Operational Picture
 - Continuous Operations in Deployed Mobile Battle Command Centers
 - Home Station Operations Centers (Reach Back)
 - Intelligence, Surveillance, & Reconnaissance
- Multinational & Interagency Interoperability
- Self-healing, Self-configuring Networks
- Joint Interdependent Battle Command
- Communicate Off the Ramp
- En-route Mission Planning
- Distributed Effects Planning
 - *Virtual Teaming* *“Solve the High Ground”*
 - Network Fires

Derived from Battle Command System (BCS) Architecture (14 JUN 02)



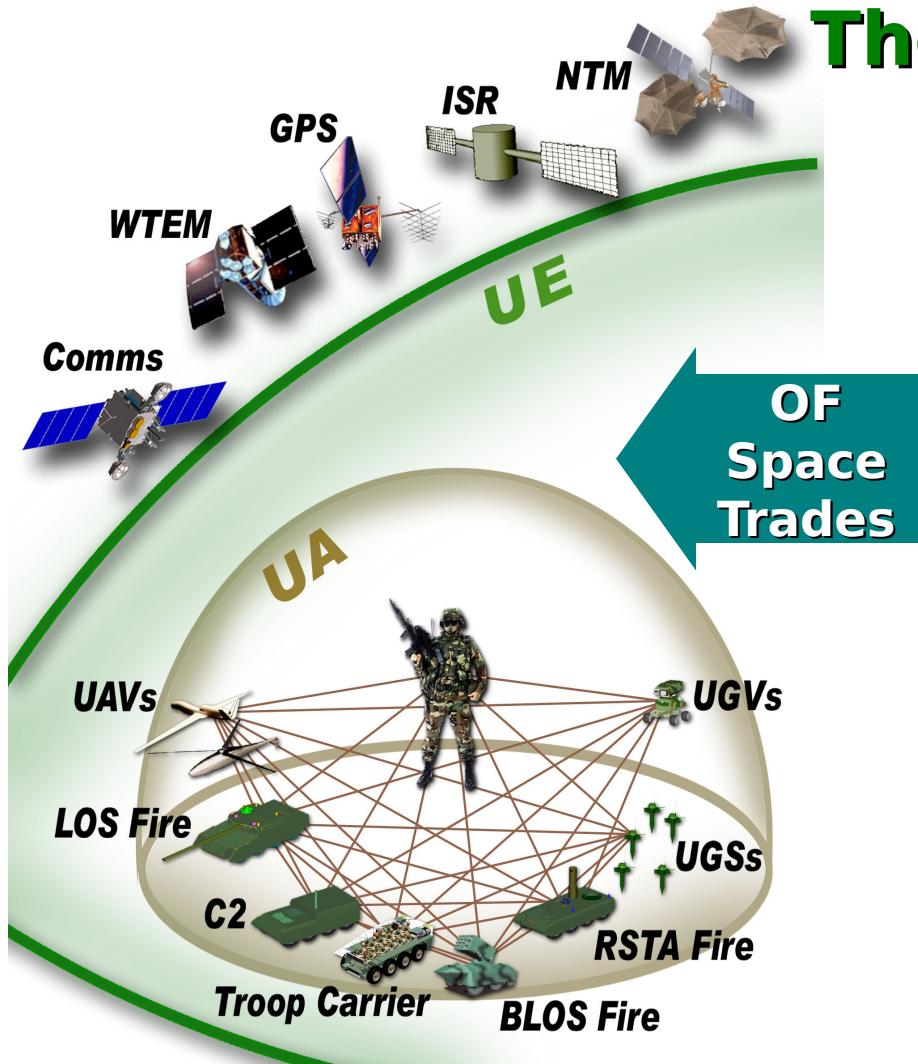
Objective Force Relevant Space Systems

- Micro-satellite Cluster TechSat 21 Demo 2005
- Elastic Bandwidth Laser Communications Wideband Gap Filler 2005 2005
- Servicing Satellite Orbital Express Demo 2008 2008
- Ground Moving Target Indication Radar Space 2008
- Jam-proof Navigation GPS III 2010
- Space Operations Vehicle Space Plane 2014





The Issue



- The OF requires linkage from the satellites down to the soldier.

The Gap—Space Representation in Army M&S

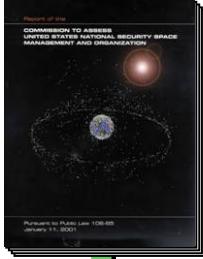
- Army models & simulations lack sufficient representation of space or space effects on land-component forces.

Current & Planned Space Representations Place Army & Objective Force Goals at Risk

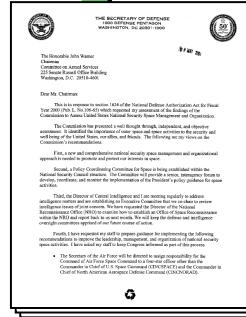
† Concepts for the Objective Force, United States Army



Tasker



11 JAN 01
**Space
Commission
Report**



08 MAY 01
**Secretary
Rumsfeld'
s
Assessme
nt**



04 SEP 01
Commander, USASMDC
Brief to Under Secretary of the
Army
02 09



DEPARTMENT OF THE ARMY
OFFICE OF THE
DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
100 ARMY PENTAGON
WASHINGTON, DC 20310-0400

DAMO-SSD

MEMORANDUM THRU DEPUTY CHIEF OF STAFF FOR OPERATIONS AND PLANS
DIRECTOR OF THE ARMY STAFF
FOR COMMANDER, U.S. ARMY TRAINING AND DOCTRINE COMMAND
COMMANDER, U.S. ARMY MATERIEL COMMAND
MILITARY DEPUTY TO THE ASSISTANT SECRETARY OF THE ARMY

03 OCT 01
DA DCSOPS Tasker

2. **Army Space requirements and capabilities are not captured in current models and simulations. As a result, there are no robust analyses to support space acquisition and develop space requirements. Additionally, the training of space battle staffs is lacking. As the Army transforms, space capabilities will play an increasingly significant role.**

to direct the preparation of a roadmap or action plan for space representation in Army M&S and Space and Missile Defense Command (SMDC) will lead this effort.

a. **Appearance requirements and capability are not captured in current models**

Commander, Space and Missile Defense Command:
(1) Army lead for an M&S Integration Concept Team (ICT) to prepare the action plan.
(2) Present an In-Progress Review to the Spring 2002 Army Models & Simulations Executive Council (AMSEC) meeting and a coordinated roadmap recommendation to AMSEC during their Fall 2002 meeting.
(3) Roadmap plan should include timelines, estimated costs, recommended proponents and requirements, if appropriate.

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The need for remediation was apparent, & the decision to proceed was made.



Space M&S FACT

